

IN THE CLAIMS:

1. (currently amended) A system for preventing stall of a vehicle engine, said system comprising:
  - an integrated starter alternator operably connected with said vehicle engine, said integrated starter alternator capable of selectively operating as a motor for transmitting torque to said vehicle engine and as an alternator for producing electric energy;
  - a first electric energy storage device in electrical communication with said integrated starter alternator;
  - a second electric energy storage device in electrical communication with said integrated starter alternator and said first electric energy storage device,
  - wherein said second electric energy storage device is operative to charge said first electric energy storage device when said integrated starter alternator is operating as an alternator for producing electric energy;
  - at least one controller in electrical communication with said integrated starter alternator; and
  - at least one sensor operably connected with said vehicle engine sending a signal indicative of engine performance to said at least one controller,
  - wherein said controller compares said signal to a predetermined condition indicative of engine stall and controls said first electric energy storage device and said integrated starter alternator to transmit a torque to said vehicle engine sufficient to prevent engine stall.
2. (original) The system of claim 1 wherein said signal indicative of engine performance is selected from the group consisting of crankshaft speed, camshaft speed and output torque.
3. (previously presented) The system of claim 1 wherein said first electric energy storage device is selected from the group consisting of a battery and a capacitor.

4. (previously presented) The system of claim 1 further comprising:
- at least one sensor operably connected with said vehicle engine sending a signal indicative of engine bus voltage,
  - wherein said controller compares said signal indicative of engine bus voltage to a first predetermined charge threshold value and controls said second electric energy storage device to charge said first electric energy storage device; and
  - at least one sensor operably connected with said second electric energy storage device sending a signal indicative of a charge condition,
  - wherein said controller compares said signal indicative of a charge condition to a second predetermined charge threshold value and controls said integrated starter alternator to charge said second electric energy storage device.
5. (currently amended) A method of preventing stall of a vehicle engine, said method comprising:
- measuring at least one engine parameter relating to engine performance;
  - detecting an engine condition known to lead to engine stall by comparing said at least one engine parameter to a first predetermined value;
  - measuring at least one charge parameter relating to engine bus voltage;
  - providing a first electric energy storage device in electrical communication with a second electric energy storage device;
  - powering an integrated starter alternator from said first electric energy storage device to apply additional torque to said vehicle engine when said engine stall condition is detected; and
  - charging said first electric energy storage device from said second electric energy storage device when said charge parameter relating to engine bus voltage is less than a second predetermined value and said integrated starter alternator is operating as an alternator for producing electric energy; and
  - ~~powering an integrated starter alternator from said first electric energy storage device to apply additional torque to said vehicle engine when said engine stall condition is detected.~~

6. (original) The method of claim 5 wherein said at least one engine parameter is selected from the group consisting of crankshaft speed, camshaft speed and output torque.
7. (previously presented) The method of claim 5 wherein said first electric energy storage device is selected from the group consisting of a battery and a capacitor.
8. (previously presented) The method of claim 5 further comprising:
  - measuring at least one charge parameter relating to said second electric energy storage device;
  - detecting an engine condition known to require charging of said second electric energy storage device by comparing said at least one charge parameter relating to said second electric energy storage device to a third predetermined value; and
  - driving said integrated starter alternator to charge said second electric energy storage device when said engine condition known to require charging of said second electric energy storage device is detected.
9. (previously presented) The method of claim 5, further comprising:
  - powering said integrated starter alternator from said first electric energy storage device to apply torque for starting said vehicle engine;
  - cranking said vehicle engine using said integrated starter alternator until said vehicle engine reaches a predetermined engine speed; and
  - supplying fuel to said vehicle engine when said vehicle engine reaches said predetermined engine speed,
  - wherein said second electric energy storage device charges said first electric energy storage device before starting said vehicle engine.

10. (currently amended) An apparatus for preventing stall of a vehicle engine, said apparatus comprising:
- means for measuring at least one engine parameter relating to engine performance;
  - means for detecting an engine condition known to lead to engine stall by comparing said at least one engine parameter to a first predetermined value;
  - means for measuring at least one charge parameter relating to engine bus voltage;
  - a first electric energy storage means in electrical communication with a second electric energy storage means;
  - means for powering an integrated starter alternator from said first electric energy storage means to apply additional torque to said vehicle engine when said engine stall condition is detected; and
  - means for charging said first electric energy storage means from said second electric energy storage means when said charge parameter relating to engine bus voltage is less than a second predetermined value and said integrated starter alternator is operating as an alternator for producing electric energy; and
  - ~~means for powering an integrated starter alternator from said first electric energy storage means to apply additional torque to said vehicle engine when said engine stall condition is detected.~~
11. (previously presented) The apparatus of claim 10, wherein said at least one engine parameter is selected from the group consisting of crankshaft speed, camshaft speed and output torque.
12. (previously presented) The apparatus of claim 10, wherein said first electric energy storage means is selected from the group consisting of a battery and a capacitor.
13. (previously presented) The apparatus of claim 10, further comprising:

means for measuring at least one charge parameter relating to said second electric energy storage means;

means for detecting an engine condition known to require charging of said second electric energy storage means by comparing said at least one charge parameter relating to said second electric energy storage means to a third predetermined value; and

means for driving said integrated starter alternator to charge said second electric energy storage means when said engine condition known to require charging of said second electric energy storage means is detected.

14. (previously presented) The apparatus of claim 10, further comprising:

means for powering said integrated starter alternator from said first electric energy storage means to apply torque for starting said vehicle engine;

means for cranking said vehicle engine using said integrated starter alternator until said vehicle engine reaches a predetermined engine speed; and

means for supplying fuel to said vehicle engine when said vehicle engine reaches said predetermined engine speed,

wherein said second electric energy storage means charges said first electric energy storage means before starting said vehicle engine.

15. (new) The system of claim 1 wherein said integrated starter alternator operates as a motor when said vehicle engine is being started and when said vehicle engine is creating torque.

16. (new) The method of claim 5 wherein said integrated starter alternator operates as a motor when said vehicle engine is being started and when said vehicle engine is creating torque.

17. (new) The apparatus of claim 10, wherein said integrated starter alternator operates as a motor when said vehicle engine is being started and when said vehicle engine is creating torque.